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ABSTRACT

The present research was designed to answer two basic questions: (1) Do children who are referred for treatment of behavior problems in one setting also exhibit such behavioral problems in the others? (2) Does behavior modification in the primary setting have any systematic effect on children's behavior in the other (secondary) setting? Thirty-five children, identified by either parents or teachers as having behavior problems either at home or at school, were involved in an intervention treatment study: (1) 15 children were referred for outpatient treatment for 'active' behavior problems in the home setting (the 'home problem' sample); (2) 12 children, the 'school problem' sample, were referred for treatment of behavior problems in the school setting; and (3) 8 children were recruited to form the 'school problem control' sample. Verbal reports by parents and teachers were obtained, and independent measures were taken in both the home and school setting on the 'deviant' children. The Walker Problem Identification Checklist was administered to the children's teachers, and the Bi-Polar Adjective Checklist was given to all parents of children before and after receiving their respective treatments. Study results indicate that unprogrammed positive generalization rarely occurs. If children have difficulty in both school and home settings they should probably receive simultaneous treatment in both settings. (CS)

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GENERALIZATION AND CONTRAST PHENOMENA IN BEHAVIOR MODIFICATION
WITH CHILDREN

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GENERALIZATION AND CONTRAST PHENOMENA IN BEHAVIOR MODIFICATION
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Requests for special treatment of a child usually come from the adult authorities in either his school or home. In most cases, the adults in one setting perceive the child to be more of a problem than those in the other, and referral for treatment is usually initiated by this "primary" source. Not infrequently, however, the adults in the primary problem setting attribute the difficulties they have with the child to the adults in the other setting. Although this accusatory attribution occurs in both directions, our experience would suggest that it most frequently leads to referral when teachers blame the "home environment" for a child's behavior problems in school. Teachers may recommend or demand that parents seek counseling for their child and/or themselves to remedy the problems which the teacher experiences. Although it is probably less frequent, the converse situation also occurs--parents seek out alternate school placement or special educational programs because of their difficulties with the child at home.

Even when the issues are not so clear, the responsible clinician must always wonder to what extent a referred child has difficulties in each of these two important settings. To what extent are the problems exhibited in one setting demonstrated in the other? Which setting should provide either the initial or primary focus of treatment? To what extent can successful treatment in one setting be expected to generalize to the other? When parents or teachers attribute their own difficulties to the

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environment created by the other, should the clinician accept their formulation or should he attempt to re-define the problem? Because clinical decisions involve individuals, the answers to these questions cannot be simple or unitary. However, it is hoped that the data reported here on cross-situational assessment of children treated in either the school or home will provide guidelines for formulating answers in individual cases.

The present research was designed to answer two basic questions:

a) Do children who are referred for treatment of behavior problems in one setting also exhibit such behavioral problems in the other? And b) Does behavior modification treatment in the primary setting have any systematic effect on children's behavior in the other (secondary) setting?

There have been a number of studies on the generalization of treatment effects from the treated to similar but untreated settings in educational and institutional environments (e.g., Kuypers, Becker, & O'Leary, 1968; Meichenbaum, Bowers, & Ross, 1968; O'Leary, Becker, Evans, & Saudargas, 1968; Walker, Hops, & Fiegenbaum, 1971; Walker, Hops, & Johnson, 1974). With the exception of the Walker et al. (1971) report, these studies yielded no evidence of positive generalization, and the Meichenbaum et al. (1968) study yielded trends suggesting behavioral contrast.

When the present research project was begun, only two studies involving very small samples had been reported on the generalization of behavior change from the home to the school (Martin, 1967; Wahler, 1969). Since then, a few additional reports have emerged on the issue of generalization of children's behavior and behavior change across these settings.

Martin's (1967) investigation differs from most others to be reviewed in this context because it does not involve behavioral observation assessment

in both settings and involves an intervention which is somewhat different from the usual behavior modification employed in the other investigations. In this study, four children exhibiting behavior problems and underachievement were selected for study. All children and their parents were assessed in a structured laboratory setting on dimensions of dyadic communications. In addition, the children's teachers were asked to describe the children's behavior on the Peterson Problem Checklist (Peterson, 1961). Two of these children and their parents were then exposed to six intervention sessions over a two week period in the clinic. These sessions were directed at modifying problematic interaction patterns through instruction and reinforcement. The two other families served as no-treatment controls. Results indicated that reductions in negative parent-child interaction for the treated families were accompanied by marked improvement in the teachers' ratings of the children. Changes on the interaction measures were less dramatic for control children. Teacher ratings showed a less favorable rating at post-assessment for one control subject but a somewhat more favorable rating for the other. Teachers were uninformed as to which children were treated and which were not. This early pilot investigation, then, showed some weak evidence for generalization on the basis of teacher ratings.

Wahler (1969) selected two children who exhibited similar behavior problems in the home and school. The children received behavior modification treatment in the home setting through parent training. Although the children's behavior changed appropriately in the homes, their problem behaviors in school remained at baseline level. Skindrud (1972) examined behavioral results with four boys who exhibited behavior problems in both settings, but received initial treatment only for the home problems. The results of this study

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substantiated Wahler's (1969) findings in showing significant change in the home but no change in the school. The question of pre-intervention generalization was not addressed in either the Wahler (1969) study or the Skindrud (1972) study since the subjects were selected because they exhibited behavior problems in both settings. In a report of early results from the present project, Walker, Hops and Johnson (1974) examined the home behavior of five children referred for special classroom treatment for conduct behavior problems. Results showed that only one of the five children exhibited a rate of deviant behavior at home which would be considered problematic by normative standards. Unfortunately, the only child who was deviant at home dropped out of the program. All four others showed a modest but nonsignificant increase ($p < .06$, two-tailed) in their deviant behavior rate at home after behavior modification treatment in a special classroom. This trend suggests a behavioral contrast effect.

Wahler (1973) reported on six children observed both in home and school after referral for treatment. Of the five children who showed behavioral disturbance in at least one setting, only one demonstrated any cross-situational consistency in behavior problems. Wahler (1974) has also given a very detailed report on three other children observed and serially treated over a two-year period in both settings. Although two of these children were perceived to have problems in both settings, the specific behavioral clusters which were problematic differed. In two cases, treatment in one setting seemed to have unpredicted effects on behavior in the other. In one case, desired increases in studying at school were accompanied by an undesired increase in self-stimulation and a decrease in social interaction at home. In the second

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case, desired decreases in oppositional behavior at home seemed to be accompanied by unexpected increases in oppositional behavior and peer interactions at school. While the second case could in a general way be characterized as an example of behavioral contrast, the phenomena illustrated in the first are obviously more complex.

In a recently completed study, Bernal, Delfini, North and Kreutzer (1974) reported on the pre-intervention generality of children's behavior in school and home settings. Twenty-one children were observed in both settings employing the same coding system. Four behavioral summary scores were used reflecting Desirable, Annoying, and Deviant Behavior and the Child's Ratio of Compliance. Cross-situational correlations on these variables were all negligible and nonsignificant. In another recently completed report, Patterson (1974) noted that 17 of the 27 conduct problem children treated in his project displayed problems at school as well as in the home.

Several investigators, coming out of another research tradition, have correlated parents' ratings of children's behavior or traits with similar ratings obtained by teachers (e.g., Becker, 1960; Rutter & Graham, 1966; Wolff, 1967). In general, these investigators found low and nonsignificant correlations between such ratings. Wolff (1967) did find, however, that as a group, children referred for outpatient or hospital treatment received higher behavior disturbance scores from teachers than did the control group children.

Thus, the more global findings as reported by Wolff (1967) and Patterson (1974) give evidence for some cross-situation generality while the other research reviewed generally suggests little or no generality. With the exception of Martin's (1967) early results, no study has provided evidence

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for either generalization or contrast in behavior change across these settings. The interpretation of all of these earlier reports is complicated, however, by the generally small size of the samples involved and the lack of control group comparisons. The present research attempted to remedy these difficulties. In addition, this research examined both the generalization of pre-intervention behavior across settings and the generalization effects of intervention in one setting on behavior in the other. Finally, both observational data and parent or teacher reports were examined in this research to answer the generalization questions.

Method

Subjects

Thirty-five children, selected because they were perceived to have behavior problems in either the home or school, were employed in this study. Fifteen of these children were referred for outpatient treatment for "active" behavior problems in the home setting. Families remaining in the program received ~~family~~ family intervention treatment as described in Eyberg and Johnson (1974) and will hereafter be referred to as the "home problem" sample. The mean age of the children in this sample was 8.5 years (range, 5.3 to 12.8). Twelve children, hereafter referred to as the "school problem" sample, were referred for treatment of behavior problems in the school setting. Four of these children received behaviorally oriented treatment in a special classroom designed for "acting out" children as described elsewhere (Walker, Hops, & Fiegenbaum, 1971; Walker, Hops, & Johnson, 1974). One child dropped out of this program. Three others received behaviorally oriented treatment in a similar special classroom designed to

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deal with children who displayed excessive social withdrawal as described by Walker, Hops, and Greenwood (1974). The four remaining children were treated in their regular classrooms for excessive acting out behavior under behavioral programs directed by J. Cobb and H. Hops (Hops & Hutton, 1974). The mean age of children in the entire school problem sample was 7.9 years (range, 6.4 to 9.1).

Eight children were recruited for research purposes and selected because their teachers perceived them to have behavior problems at school sufficiently severe to warrant referral for special treatment. This group, which was recruited in the same manner as the school problem sample, will hereafter be referred to as the "school problem control" sample. The mean age of children in this sample was 7.5 (range, 7.2 to 8.3). In the school problem sample, children were accepted for treatment only if behavioral data confirmed the presence of teacher perceived behavior problems. In the school control sample, teacher perception of the child's serious behavior problems was sufficient for inclusion, but, as the results will indicate, the two school problem samples were essentially equivalent. Similarly, in the home problem sample, the parents' perception of serious behavior problems was sufficient to warrant initial assessment.

Measurement Instruments

Walker Problem Behavior Identification Checklist. The Walker Problem Behavior Identification Checklist (Walker, 1970) was administered to the children's teachers. This 50-item, weighted checklist of behaviors yields a total behavior problem score and five separate factor scores. The total score has been shown to have a split-half reliability of .98. Further, the total score has been shown to reliably discriminate between normal and

behaviorally disturbed children as defined by other criteria. Normative data has been collected on a 21-teacher sample involving ratings of 534 children in grades four, five, and six (Walker, 1970). In the present study, Walker's (1970) guidelines were followed in defining a child as behaviorally disturbed if his score was one standard deviation above the normative mean.

Bi-Polar Adjective Checklist. The Bi-Polar Adjective Checklist was administered to all the parents of children before and after receiving their respective treatments. This 47-item checklist originated by Becker (1960) calls for parental description of their child and yields five factor scores for parents as derived by Patterson and Fagot (1967). In previous research (Lobitz, G. & Johnson, 1974), this measure has been found to discriminate well between referred and nonreferred children on all five factors. Normative data has been collected in this laboratory on a sample of 146 parents of 73 children between the ages of 4.0 and 8.0 years of age. Analyses of this data indicated that the Aggressiveness, Activity and Conduct Problem factors correlate highly, and their sum has been found to discriminate very well between referred and nonreferred children (Lobitz, G. & Johnson, 1974). For the purposes of the present investigation, children whose score fell one standard deviation above the normative mean for children aged 6.0-8.0 were considered to be perceived as behavior problems by their parents.

Home Observations

Home observations were conducted under the same conditions and with the same coding system as employed in earlier normative research on child behavior and family interaction (e.g., Johnson, Wahl, Martin, & Johansson, 1973).

The observations were conducted for 45 minutes each day during the hour prior to the family's regular dinner time when all family members were usually present. Five families in the school-problem sample were observed for three days; all other observation statistics are based on five days of observation. All family members were required to be present and remain in a specified two-room area during the observations. Further, home observation rules prohibited interaction with the observer, operation of the television set, and the presence of visitors in the home. The parents were instructed to try to behave as they would if no observers were present and to present as representative a picture of their family as possible.

A revision of the observational system developed by Patterson, Ray, Shaw, and Cobb (1969) was employed. This revised system utilizes 35 distinct behavior categories to record all the behaviors of the target child and family members who interact with him.

On the basis of previous research, 15 behaviors were designated as "deviant" for children, and the sum of the rates of these behaviors was designated as the child's deviant behavior score. The deviant behaviors are demand attention, violation of standing command, destructiveness, high rate behavior, humiliation, noncompliance, physical negativeness, smart talk, teasing, tantrums, whining, yelling, threatening command, ignoring, and negativism. These behaviors were most consistently described by a sample of 146 parents of young children to be deviant. Previous research has indicated that these behaviors tend to receive a relatively high proportion of negative consequences from the social environment (Wahl, Johnson, Johansson, & Martin, 1974), and that there is a strong relationship between the average parent rating of the behavior as deviant and the average family's

tendency to respond to it in a negative manner (Adkins & Johnson, 1972). The validity of the child-deviant behavior score is also enhanced by the finding that it discriminates significantly between a group of children referred for out-patient treatment of behavior problems and a matched nonreferred group (Lobitz, G. & Johnson, 1974). Other research has demonstrated that the child deviant behavior score is reliably and dramatically higher when parents are instructed in home observations to make their child appear deviant than when they are instructed to make him appear nondeviant (Johnson & Lobitz, 1974). W. Lobitz and Johnson (1974) have replicated this finding in families with both deviant and nondeviant children and demonstrated that this discrepancy is primarily due to parents' ability to make their child appear deviant. Previous research has also indicated that the child deviant behavior score has high stability over time (Johnson & Bolstad, 1973). The child's deviant behavior score was used as the central dependent variable from the home observation in this study. Normative data is available on this home observation statistic for a sample of 73 children between the ages of 4.0 and 8.0. For the purposes of this study, a child was considered deviant on this measure if he fell one standard deviation above the mean for children between the ages of 6.0 and 8.0 ($N = 40$).

Observations were made by a group of young female research assistants. The observers were trained continuously on a weekly basis throughout the period involved in this study. Except for a few information leaks, the observers were unaware of the status of the child, the treatment stage, and the purpose or hypothesis of this study. A different observer was always employed for the baseline and termination assessments on any given child.

A calibrating observer accompanied the regular observer for one day of observation on 49 occasions covering all 32 families. The observer agreement was computed by a correlation between the two data sets on the deviant behavior score, as recommended by Johnson and Bolstad (1973) and Hartmann (1974). The correlation between the sets of observers on the overall deviant behavior proportion was .94.

School Observations

In general, children were observed in their classrooms on five consecutive days for thirty minutes per day. These periods were chosen on a random basis. Due to the usual fluctuation in school scheduling, observers obtained an average of 142.78 minutes of behavioral data per child. The children's classroom behavior was coded by the system developed by Cobb and Hops (1972). This system contains 37 code categories and was used to record the behavior of the target child as well as all of his interactions with his teacher and peers. This system was used on all the children except the first five school problem children observed. These children were observed on a system devised by Walker (1971).

For the school observation system used on all other children, 11 codes of the total 37 were selected on an a priori basis to represent child deviant behavior in the classroom situation. This deviant behavior code comprised the dependent variable from this data source. Deviant behavior codes were call out, look at another, talk about other material, play, disruptive behavior, physical negative, noisiness, inappropriate locale, noncompliance to management commands, noncompliance to academic commands and noncompliance to disciplinary commands.

The observers were trained continuously on this coding system, and the same procedures as outlined above were employed to keep the observers unaware of the child's status and treatment stage in the research.

Observer agreement was checked in 26 separate sessions, using the percent agreement calculation system for all codes employed. To count as an agreement, both observers were required to see the same behavior in the same 10-second block. Agreements were calculated for target child, teacher, and peer behaviors. The average percent agreement in this sample was 87.88%.

Unfortunately, there is no adequate normative data on this coding system. However, on the basis of previous experience with this system in classrooms, the authors designated a cut-off score for considering children to be deviant by this measure. Thus, on each of the two measures used in the home and school, a deviant cut-off score was operationalized to help answer the questions posed.

Results

The question of pre-intervention generalization will be considered first. At the most general level, it may be asked, what proportion of those children referred for treatment of behavioral difficulties in one setting exhibited similar difficulties in the other? This question may be answered both in terms of the observed rates of relevant behaviors in the secondary setting and by the report of significant adults in that setting. For this initial analysis, the school problem sample and the school problem control sample were combined. This was done because the recruitment procedures were nearly identical for both samples, and the teacher ratings and observed deviancy levels of both groups were quite similar. The mean Walker score for the school problem sample was 27; for the control sample, it was 31. This

difference was not significant ($t < 1$). The deviant behavior scores in school were also similar and not significantly different (school problem sample deviant behavior percent mean = 25.66%, control sample deviant behavior percent mean = 28.41%).

It will be recalled that except for observed deviance in the school, a child was characterized as "deviant" on each measure on which he scored beyond one standard deviation as defined by the appropriate normative sample. Since such a normative sample was not available for the school observation data, an arbitrary cut-off point was established based on previous research with similar observation systems. Any child whose deviant behavior exceeded 20% of his total behavior was characterized as deviant in the school. The proportion of children considered deviant by each measure in each of the two samples is presented in Table 1. Considering the combined school problem sample

Insert Table 1 About Here

first, it can be seen that for the 11 children for whom Walker Problem Behavior Identification Checklist scores were available, 82% of them would be considered deviant in the primary (school) setting. For the same children, 100% had deviant behavior scores in the classroom. It will be recalled that the first five school problem children in this project were observed under a different coding system than that used for the other children, and their teachers were not administered the Walker Problem Behavior Identification Checklist. The behavioral data on these children as reported in Walker, Hops, and Johnson (1974) clearly indicates, however, that they were deviant in the classroom as determined by systematic observation, and their teachers

referred them because of active behavior problems. Thus, it was considered appropriate to include these children in the overall analysis of behavioral generalization in the secondary (home) setting.

For the combined school problem sample ($N = 19$), 42% would be considered deviant at home by the home observation criteria. This observed percentage significantly exceeded the expected percentage based on available normative data ($\chi^2 = 9.76$, $p < .01$). Using the parent rating scale, 67% of the mothers and 78% of the fathers gave ratings to their children which would place them in the deviant category. The Chi-Square for both proportions was significant beyond the .01 level of confidence. Thus, by all criteria, a greater than chance proportion of the school problem children were documented to have behavior problems in the home setting.

Considering the home problem sample, it can be seen by reference to Table 1 that 100% of both mothers and fathers described their children as deviant via the verbal report measure. Only 47% of these children, however, had deviant behavior scores which were one standard deviation above the normative mean. Possible reasons for this discrepancy have been discussed at length elsewhere (Eyberg & Johnson, 1974; Lobitz, G. & Johnson, 1974). Similar results have been reported by Hendriks (1972) on children seen in G. R. Patterson's laboratory.

Sixty-seven percent of these children referred for home problems were perceived to exhibit significant behavioral difficulties in the classroom by teachers as measured by the Walker Problem Behavior Identification Checklist ($\chi^2 = 21.87$, $p < .01$). By the behavioral observation criterion, 50% of these children were classified as showing problematic behaviors at a rate designated deviant ($> 20\%$).

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At a more precise level, it may be asked to what extent the behavioral rates and behavior ratings correlated across the two settings. This question must, however, be answered in the context of considering the validity of the measures used. In other words, before considering the correlation between the teachers' rating of a child in school and his deviant behavior rate at home, the correlation between his parents' rating of his behavior at home and his actual behavior in that setting must be considered. All such correlations should be examined with a full recognition of the considerable error variance that can be introduced by the use of different raters responding to the rating scale forms. While it is known that the trained observers operate under highly similar response sets in examining children's behavior, it is to be expected that different parents and teachers approach rating scales with different response sets. This factor introduces considerable error variance in the scores obtained, and, at least partially, would account for the low correlations obtained in other research where different raters were used (Becker, 1960; Rutter & Graham, 1966; Wolff, 1967). Nevertheless, since ratings by parents and teachers are used to label children as deviant, it is of considerable interest to know to what extent these ratings may be used to estimate a child's observed deviancy. The rank order correlations relating all measures on all children in this sample are presented in Table 2. Examination of Table 2 will reveal that all correla-

Insert Table 2 About Here

tions were negligible, and all but one were not significant. Very little relationship was documented between parents' and teachers' ratings of a child and his behavior in either the primary or secondary settings. The one

exception to this involved the correlation between the Walker Problem Behavior Identification Checklist and the observed deviant behavior percent in the home. Since only one of the nine correlations was significant, however, this rather weak relationship should be cautiously interpreted. These correlations should also be examined in light of the fact that the sample examined here is an extreme one in terms of the deviancy levels in both settings, and that the full range of the population is not represented. This factor would also tend to lower the magnitude of correlations.

Behavior Change

In examining the question of generalization of behavior change, it is first necessary to document change in the primary setting. In each analysis which follows, changes will be examined in both the primary and secondary settings, and these changes will be compared with those observed in the school problem control group. In each case, the within-group changes were tested by the use of paired-observation t -tests. Comparisons with the school problem control group were accomplished using 2×2 analyses of variance with repeated measures on one factor (time). The group $\times$ time interaction in these analyses was the critical test of differential group change over time. All deviant behavior proportions were subjected to arc-sin transformations before statistical analyses.

The school problem control group should be considered a quasi-control group (as in Campbell and Stanley, 1966), especially with regard to the home treated sample. In spite of some differences in recruitment procedures and pre-post time lag, the school problem control sample bears considerable similarity to the home treated sample in terms of pre-intervention scores on both parent report and home observation data. In addition, this control

group data represents one of very few examples of research where such behavioral data has been collected on an untreated sample.

School problem samples. The three school problem samples will be considered separately since the treatment procedures and results differed somewhat for each. The first four cases to be considered were children referred for active behavior problems in the school setting and treated in a special classroom under the direction of H. Walker. The analysis of the behavioral data on the children treated in this classroom have been reported in detail in Walker, Hops, and Johnson (1974). This analysis clearly demonstrated that the children's behavior consistently improved in the classroom from baseline to termination as a consequence of treatment in this special classroom ($p < .01$).

An examination of the changes in the secondary setting for this sample, however, revealed that the children's deviant behavior at home increased in every case, from a pre-intervention average of 1.35% to a termination average of 2.85%. A t -test for paired observations revealed that this reliable change approached statistical significance ($t = 3.04$, $df = 3$, $p < .06$). A contrast of this group with the school problem control group is of questionable meaning because the pre-test deviant behavior mean of the control group of 9.71% was considerably higher than that of the treated group ($t = 2.73$, $df = 10$, $p < .05$). In addition, the pre-post time lag of home observation differed appreciably between these two groups. The lag was 3.55 months for the treated group, but only 2.05 for the control group. Although the deviant behavior decreased slightly to 8.35% in the control group while it increased for the treated group, the 2×2 analysis of variance on this data did not yield a significant group $\times$ time interaction.

The second school treated sample involved three children referred to another structured classroom under the direction of H. Walker which was designed to deal with children exhibiting excessive social withdrawal. The behavioral data again clearly showed that the deviant behavior of these children was dramatically reduced at school. Unfortunately, the baseline data for one of these subjects was lost; but, data on the other two subjects indicates that inappropriate behavior was reliably reduced from a baseline level of 63% to a post-intervention level of 33%. In addition, the post-intervention data on the other child indicates that his deviant behavior percent was 7.14 after intervention--clearly well within normal limits. In addition, H. Walker's data on this child further supports the fact that a clear reduction in inappropriate behavior was observed from baseline to follow-up in the regular classroom (59% reduction). Although statistical analyses of these data are somewhat questionable because of the very small sample size, it is interesting to note that the changes in the two cases for which data is complete were sufficiently dramatic to be statistically significant both by the paired observation t -test ($p < .025$) and by contrast with the school problem control group ($p < .01$).

In this same sample, however, the rates of deviant behavior in the home increased for two of the three children. Unlike the previous sample, the two children who evidenced increases in deviant behavior at home were initially in the deviant range on this measure. One child increased from a baseline level of 14.3% deviant behavior at home to a post-intervention level of 22.2% while the other child increased from 6.3% to 9.0%. In the third case, deviant behavior decreased from a baseline average of 2.0% to a post-intervention average of .1%. The average pre-post time lag of home

observation was quite comparable for this group and the control group-- 2.19 months for the treated group versus 2.05 for the control group. The average increase for these three cases was not statistically significant, however, either by paired observation t -tests or by contrast with the school problem control group in a 2×2 analysis of variance. And, in contrast, parents consistently rated their children as improved at termination on the Becker Bi-Polar Adjective Checklist ($p < .10$ for both mothers and fathers).

It is interesting to note that six of the seven children who were treated with these very effective special classroom programs showed a concurrent increase in deviant behavior as measured in the home. The average deviant behavior percent at home increased in the treated group from 4.0% at baseline to 6.1% at termination ($t = 1.82$, $df = 6$, $p < .06$) while the control group mean decreased from 9.7% to 8.4%. Although the deviant behavior percents were higher for the control group at both points, these differences were not significant. A contrast between the seven children treated in the special classroom with the eight control children was performed. The 2×2 analysis of variance revealed that the group $\times$ time interaction was not statistically significant, but the trend is sufficiently obvious to be of interest ($F = 2.08$, $df = 1,13$, $p < .20$).

The third school problem sample involved four children treated in their regular classrooms in a program under the direction of J. Cobb and H. Hops. The changes in the overall percent of inappropriate classroom behavior did not, in and of themselves, support the efficacy of that program, but other data sources do provide evidence of desired changes. The inappropriate behavior percent showed a nonsignificant increase from a pre-intervention level of 26% to a

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post-intervention level of 33%. A closer examination of the data revealed, however, that these four children had relatively high rates of high intensity, acting out behavior. The high intensity deviant behaviors coded in this system were pre-selected and are disruptive behavior, physical negative, noisiness, inappropriate locale, noncompliance to management commands, noncompliance to academic commands, and noncompliance to disciplinary commands. The average high intensity deviant behavior percent decreased from 8.19% to 5.93%. The decrease which was realized in three of these four cases approached significance by a paired observation t -test ($t = 1.78$, $df = 3$, $p < .10$, one-tailed). In addition, all four children were given improved scores by their teachers on the Walker Problem Behavior Identification Checklist. A paired observation t -test indicated that this reduction also approached significance ($t = 2.18$, $df = 3$, $p < .07$). The average pre-post time lag of home observation was 2.44 months for this group as compared to 2.05 months for the control. The positive changes observed on both the Walker Problem Behavior Identification Checklist and on the high intensity deviant behavior scores were not significant when contrasted with the school problem control group in a 2×2 analysis of variance. In general, then, the evidence of positive change in the primary setting is less persuasive for this sample than for those cases treated in the special classroom.

For these four children, there was no evidence of either positive generalization or contrast effects in the secondary setting as measured either by the parents' responses on the Becker Bipolar Adjective Checklist or by the observational data. For the group as a whole, the changes in these measures were negligible and nonsignificant.

Home treated sample. Complete data at baseline and termination in both settings is available on only eight of the fifteen children originally referred for home treatment. This attrition is due to children being referred elsewhere for treatment after the initial assessment ($N = 5$), to families dropping out of treatment ($N = 1$), or to the fact that treatment was completed in the summer months when school was not in session ($N = 1$). Every parent in this sample described their child more favorably at termination than at baseline on the parent rating form. These changes were significant for both mothers ($t = 6.38$, $df = 6$, $p < .005$) and fathers ($t = 3.65$, $df = 6$, $p < .005$). As indicated earlier, no change in parent ratings was observed in the control group. Two separate analyses of variance on mother and father ratings comparing these two groups reveal significant groups x sessions interactions at the .05 level of confidence.

Consistent with previous research (Eyberg & Johnson, 1974), the deviant behavior score derived from observation did not document the efficacy of treatment in the primary (home) setting (paired observation $t > 1$). Other behavioral data, however, did document such beneficial changes. For example, when those behaviors which were directly related to treatment programs were isolated, there was an overall 46% reduction in targeted deviant behaviors. This difference approached statistical significance ($t = 1.54$, $df = 7$, $p < .10$). Parent collected data on treated behavior problems indicated an average reduction of 64% from baseline to termination. Thus, while there was evidence of change in the primary setting on the basis of observed targeted behaviors, parent attitude, and parent collected data, the changes in overall observed deviant behavior were disappointing. As indicated earlier, there was no

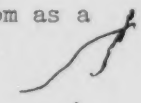
appreciable change in the deviant behavior rate of the control group, and the 2x2 analysis of variance yielded a nonsignificant group x time interaction on total deviant behavior.

Examination of data in the secondary (school) setting for this sample indicates that the average teacher rating on the Walker Problem Behavior Identification Checklist was virtually identical at both testing periods (27.16 at baseline versus 27.33 at termination). Thus, there was not a significant pre-post change on this measure, and a comparison with the control group revealed no significant main effects or interactions.

The observational data from the classroom is presented in Figure 1 for the school treated and school problem control samples. As can be seen,

Insert Figure 1 About Here

the control group mean is higher than the home treated mean at baseline, but the difference was not significant ($t < 1$). On the average, the behavior of the treated children increased somewhat from baseline to termination, and this increase occurred for four of the five children on whom such data was collected.² This increase was not significant by a paired observation (within group) t -test ($t = 2.04$, $df = 4$, $p < .12$, two-tailed). The behavior of the school problem control group improved slightly but not significantly ($t < 1$). The 2 x 2 analysis of variance contrasting the home treated and school problem control groups yielded a significant group x sessions interaction ($F = 5.46$, $df = 1,11$, $p < .05$). This interaction is obviously a function both of the slight improvement in the control group and the noticeable deterioration in the home treated group. Thus, by this observational measure, there is some evidence of a contrast effect in the classroom as a



function of treatment in the home. The quasi-control nature of the comparison group should not be lost sight of. In particular, it should be clarified that the time lag between school assessments was considerably longer for the home treated sample than for the school problem control sample (3.48 months versus 1.79 months).

Discussion

The results of this study seem to provide persuasive evidence for pre-intervention generality of children's behavior problems across settings. Children who were perceived to have behavioral difficulties in one setting had a good chance of demonstrating deviance in the other. This was true both in terms of the behavior ratings by significant adults in the alternate setting and in terms of objective behavioral observation by trained observers. These results lend some support to the commonly held belief that high levels of behavioral deviance in children has some cross-situational consistency. By the same token, it should be emphasized that these same results indicate that children who have problems in one setting do not necessarily have them in the other.

It is interesting to note in examining Table 1 that the verbal report measures always designated a higher proportion of children as deviant than did the observational measures. This was true for both the primary setting and the secondary setting. Such results for the primary setting may simply reflect the referral process. When parents or teachers refer their wards for special treatment, they are likely to indicate on verbal report inventories that the children are in fact deviant. Of more interest is the fact that this same trend holds for the secondary setting. For example, 67% of the mothers and 78% of the fathers of children who experienced school problems rated their children in the deviant range on the Becker i-Polar

Adjective Checklist. The home observation data indicated that only 45% of these children would be rated as deviant by this criteria. The same trend may be observed in comparing the proportion of children in the home problem sample who were characterized as deviant by their teacher and by the school observation (63% versus 50%). Part of these discrepancies may be due to communication between the parents and teachers, and reflect more of a social labeling process than an accurate perception of the child's behavior in the secondary setting.

Although these results as presented in Table 1 are analyzed in a very global fashion, this presentation seems to be most relevant, particularly for applied purposes. To the present authors, it does not seem necessary to document that the same clusters of behaviors are represented in both settings to demonstrate the generality of behavior problems. The school and home settings are very different, and behaviors which are inappropriate in one may be quite appropriate in the other. The school setting is generally a much more restrictive and prescriptive one in which a far greater number of behaviors are inappropriate. This probably accounts for the fact that a deviant behavior percent of 6% is in the deviant range in the home while such a percent at school would generally be viewed as very low indeed.

Neither does it seem necessary to demonstrate high correlations between the deviant behavior rates in both settings. While in the present study the rank order correlations between school deviance and home deviance as measured by any criteria were very low, children who were deviant in one setting had a far higher probability than would be expected by chance of being deviant in the alternate setting. The various methodological problems outlined earlier could be expected to contribute to lowering these correlations.

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These problems include the variability in response sets that individuals use when completing verbal report questionnaires, and the fact that there is a rather restricted range of scores in this generally deviant sample. The observational data in the classroom is particularly restricted in range, thereby contributing to low correlations.

In considering the issue of behavior change generalization, the fairly consistent trends in the direction of behavioral contrast are of interest and potentially of considerable importance. Such trends were clearly present in the changes in school behavior of those subjects treated in the home context and in the home recorded behavior of those children treated in the special structured classrooms. No such effects were apparent, however, for those school problem children treated in their regular classrooms. These trends should be interpreted with caution because of the small sample sizes involved, the relatively small magnitude of the effects, and the marginal statistical significance of many of the results. Nevertheless, the consistency of these trends across samples seems to warrant the most serious attention. While the present authors are not at all confident that these results will reliably replicate, the present findings together with the results of several other investigations lead to the conclusion that such contrast effects can occur. Thus, a review of the available literature on such effects and the various explanations accounting for them seems warranted.

A review of behavior modification studies indicates that such contrast effects are not without precedent. Meichenbaum, Bowers, and Ross (1968) treated institutionalized behavior problem adolescent girls by initially reinforcing appropriate classroom behavior during the afternoon but not during the morning. The proportion of appropriate behavior in the afternoon class

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increased from a baseline average of 46% to 65% during the first week of intervention and 83% during the second week. At the same time, however, appropriate behavior in the morning class declined from a baseline average of 54% to 52% during the first week and 36% during the second week. Skindrud (1972) subjected this data to statistical analysis and found that the reduction from baseline observed in the second week was significant at the .10 (two-tailed) level of confidence. Nine of the ten subjects in this experiment showed a reduction of appropriate behavior in this nonreinforced period. In addition, the authors report anecdotally that one subject clearly stated that she and her classmates would not "shape up" without reinforcement. Although less persuasive, both Skindrud (1972) and Wahler (1974) have discussed individual cases in which children's improvement in the treated setting was accompanied by undesirable behavioral changes in another setting. Although such changes in individual cases may merely reflect chance fluctuation, it seems noteworthy that these investigators considered the effects of sufficient substance to discuss them at length.

Two separate areas of more basic research yield data which may bear on the present concerns. The first is the body of research on the behavioral contrast effect. The second is that research in the attribution theory literature which involves the concept of "overjustification."

Contrast effects have been demonstrated with animal subjects placed on multiple reinforcement schedules. A multiple schedule is one in which at least two schedules of reinforcement are alternately applied with different discriminative stimuli associated with each schedule. Contrast effects are said to occur when a) the reinforcement schedule associated with one discriminative stimulus (S_1) is altered, b) the response rate associated

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with that stimulus (S_1) is altered, and c) the response rate to the alternate discriminative stimulus (S_2) changes in the opposite direction from that observed for S_1 .

The description of one experiment which demonstrates the contrast effect may clarify the usual procedure. Reynolds (1961) trained pigeons to respond to both a green and red light as discriminative stimuli. Both stimuli were associated with the same variable interval (VI3') schedule of reinforcement. After five sessions of such training, the animals were subjected to discrimination training through a cessation of reinforcement in the presence of the green light. The results indicated that as the animals decreased their rate of responding to the green light, they increased their rate of responding to the red light. Such an increase in response to the unaltered stimulus is termed a positive transfer. The term "negative transfer" is applied to the phenomenon in which the response rate to the altered component increases while the response rate to the unaltered component decreases.

Research on contrast effects is quite extensive, and several reviews of these studies are available in the literature (e.g., Dunham, 1968; Freeman, 1971; Terrace, 1966). Two basic explanatory hypotheses have been forwarded with reference to the contrast effect. Terrace (1966) and Anzel (1958) have argued that positive contrast effects may be due to some kind of emotional arousal elicited by extinction or time-out. Others have argued that while this emotionality hypothesis may be a viable one for explaining positive contrast, it appears less persuasive in the explanation of negative contrast. Reynolds and Limpo (1968) have argued that contrast is a more or less lawful phenomenon affected by changes in the relative amount of reinforcement associated with the discriminative stimuli. Thus, in the

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earlier experiment by Reynolds (1961), there is relatively more reinforcement in the presence of the red light when the green light is associated with extinction procedures. For a more extensive discussion of these theoretical controversies, the reader is referred to Freeman (1971) and Dunham (1968). Although the contrast effects observed in the animal literature are somewhat more precisely defined than the more global contrast changes observed in the present study, the explanatory concepts used may shed light on the contrast effect phenomena observed in treatment studies such as the present one.

Attribution theorists have frequently demonstrated that extrinsic reward can differentially influence one's attitudes or behaviors. According to attribution theory, such effects are due to changes in the individual's perception of the causes of his behavior (cf. Bem, 1967, 1972; Nisbett & Valins, 1971). Theories of self-perception emphasize the importance of the individual's accounting for his own behavior and postulate that an individual will perceive his behavior as externally directed if externally controlled contingencies are sufficiently salient and unambiguous. When external contingencies are not apparent or appear insufficient to maintain behavior, the individual will tend to attribute his behavior to more intrinsic motivations. This theorizing is most germane to the present concerns for the derivation of the "overjustification" hypothesis. Lepper, Green, and Nisbett (1963) define this hypothesis as "...the proposition that a person's intrinsic interest in an activity may be undermined by inducing him to engage in that activity as an explicit means to some extrinsic goal" [p. 130]. These authors and others (e.g., Deci, 1971; Nisbett & Valins, 1971) have reasoned that if external reinforcement or justification for behavior is "psychologically oversufficient," an individual may tend to perceive his engaging in that



behavior as externally determined and of less intrinsic value. This proposition would predict that such "overjustification" would result in a subsequent decrease in the relevant behavior in situations in which the external reinforcement or justification was absent. Although Nisbett and Valins (1971) reviewed a few reinterpreted experiments which gave some evidence for this hypothesis, there has been rather little direct experimental testing of it.—

An experiment by Lepper, Green, and Nisbett (1973), however, provides persuasive support for the "overjustification" hypothesis using a subject population and setting which make it highly relevant to the present concerns. In this experiment, nursery school children were provided the opportunity of engaging in a drawing activity in a relatively unstructured classroom situation. Those subjects who demonstrated some sustained participation in drawing were selected as subjects for the experiment. Children were brought to a separate experimental room and asked to engage in drawing for a six-minute period. One-third of the children contracted to engage in the activity in order to obtain an extrinsic reward--a decorated certificate which had been found to be reinforcing for nursery school children in previous research. A second third of the children were simply asked to engage in the drawing task and were given the same reward without any prior expectation. A third group received no reward. After all selected subjects in one classroom had completed the procedures, the drawing materials were re-introduced into the classroom. In line with the expectations, the children in the expected reward condition engaged in drawing only about half as much as children in the other two groups ($p < .025$). The amount of drawing behavior did not differ significantly between the two control groups. The overjustification

hypothesis was supported in this experiment because the reduction in target behavior was observed only in the group where the reward had been contracted for or expected.

The results reported by Lepper, Green, and Nisbett (1973) and by Meichenbaum, Bowers, and Ross (1968), taken together with the present findings, should at least alert one to the possible adverse behavioral effects that may be involved with the use of extrinsic reinforcers. While a good deal of research is available to suggest that these effects do not always occur (e.g., Kuypers et al., 1968; O'Leary et al., 1968; Walker, Hops, & Fiegenbaum, 1971), the authors are convinced that such negative "side effects" can occur. The reasons for the occurrence of such effects are far from clear, but the theoretical propositions forwarded to explain both behavioral contrast and "overjustification" provide some useful suggestions.

Both the school and home behavior modification programs to which children in the present sample were exposed were quite complex, involving the use of many procedures including token reinforcement, social reinforcement, response-cost contingencies, time-out and extinction. These procedures were employed both for the purpose of increasing the rates of desired behavior and decreasing the rates of undesired behavior. It is possible to envisage the operation in these cases of any of the explanatory processes already introduced. For example, it is conceivable that the use of response-cost, extinction, and time-out procedures could have produced sufficient frustration in one setting to affect an increase in the rate of undesired behaviors in the other. This explanation is, however, the least plausible to the present authors since such effects would probably be most apparent

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in the initial phases of treatment and of rather little consequence by the time programs were terminated. While such effects could be responsible for some initial behavioral contrast, it appears less likely that they would be responsible for contrast measured at termination. Second, it is quite possible that the subjects perceived the change in relative reinforcement provided in the unaltered setting, and responded accordingly. That is, the reinforcement for appropriate behavior in the unaltered setting would presumably have been relatively less, and the reinforcement for inappropriate behavior would have been relatively greater. This shift could lead to an associated decrease in appropriate behavior and/or an increase in inappropriate behavior in the unaltered setting. Finally, it is conceivable that such changes occurred because of changes in the children's intrinsic motivation associated with the relevant behaviors.

In considering the overjustification explanation, it is relevant to consider that observational studies of children in both the classroom and home indicate that the proportion of appropriate child behavior is generally quite high even for the most deviant children (e.g., see Johnson et al., 1973; Lobitz, G. & Johnson, 1974; Patterson, 1974; Walker, Mattson, & Buckley, 1971). Thus, it is possible that in some cases, the reinforcement of appropriate behavior in one setting will cause it to be perceived as less intrinsically valuable and affect its decrease in a nonreinforced setting. In this connection, it is of interest to note that all four children in the present sample who were treated for "acting out" behavior in the structured classroom all showed deviant behavior rates below the normative mean in the home before intervention and reliably increased in rate after intervention. Three of the four children who increased in deviant

behavior in school after treatment in the home showed initial baseline levels of deviance in school below the 20% cutoff. It should be pointed out, in contrast, that there were also cases in the school treated and home treated samples where baseline levels were initially above the cutoff score and in which an increase in deviant behavior was also observed. In addition, it should be pointed out that simple regression to the mean effects could account for such changes in extreme scores. That is, the regression to the mean phenomenon would predict that extreme scores would tend to approach the mean on a second testing.

Irrespective of these considerations, it is also quite possible and congruent with some clinical experience that children can perceive "bad" behavior as the antecedent condition for the introduction of a reinforcement system, and, further, that they will use this realization to manipulate the adults in the environment (as in Meichenbaum, Bowers, & Ross, 1968). We have had the experience, for example, that children reinforced for certain classes of compliance to commands may refuse to obey other commands unless reinforcement is instituted for them. It appears unlikely that such maneuvers would occur cross-situationally with different adult authorities, but such a phenomenon is not inconceivable. It is likely in dealing with human subjects, using complex behavior modification programs, that multiple processes may be active to account for contrast phenomena, depending on the modification system employed and the individuals involved.

Although the evidence is at this point scanty, there is data to suggest that negative "side effects" in the form of contrast phenomena can occur. As a consequence, it would seem incumbent on those who employ such programs to recognize this possibility and to make some attempt to check for contrast.

In addition, it would seem advisable to consider procedures which would minimize the possibility of such side effects. To the present authors, it would seem likely that this could be accomplished by greater use of natural and social consequences, and, when this is not possible, to employ the most rapid fading from tangible to natural and social consequences. The "overjustification" hypothesis would seem to argue for the use of the most minimal extrinsic contingencies possible, of whatever kind. In discussing the implications of self-perception theory and research for behavior modification, Kopel and Arkowitz (1974) made the same recommendations and reviewed additional research consistent with it. Self-perception theory would predict that if a reward were very minimal yet associated with response emission, it would lead one to perceive the emitted behavior as intrinsically valuable, thereby affecting an increase in its future probability under nonrewarded circumstances. This theoretical viewpoint leads one to consider the possibility of fading from an initially sufficient or over-sufficient reward to an "insufficient" reward (i.e., a reward which would not initially maintain behavior). If this could be accomplished with adequate behavioral maintenance, both positive generalization across settings and resistance to extinction might be enhanced.

Another possible approach, consistent with self-attribution notions, would involve enhancing the individual's perception of self-determination in spite of the existence of powerful external contingencies. In other words, it can be emphasized to the individual that his behavior is completely under his own control. While the environment may respond to his behavior in a contingent fashion, it is completely up to him how he will respond to those contingencies. For a dramatic example of this approach, the reader

is referred to a case study by Milton Erickson reviewed by Haley (1973, pp. 213-221).

In some situations, it may be productive to frankly label the use of extrinsic contingencies as prosthetic and actively encourage the individual to work toward the ultimate goal of their removal. This would seem particularly salient in situations where high status individuals are not subjected to such prosthetic treatment (e.g., peers, older siblings, parents, etc.). Some token economy programs in institutions appear to have been designed with this concept in mind (e.g., Atthowe & Krasner, 1968).

Alternatively, the perception of self-determination would seem clearly enhanced by the use of self-management procedures. Among other things, such procedures would include the subject's involvement in establishing and administering the contingencies applied to him. Although the effects have often been found to be weak, there is evidence to suggest that self-administered contingencies produce behavior which is more resistant to extinction (Bolstad & Johnson, 1972; Johnson, 1970; Johnson & Martin, 1973; Kanfer & Duerfeldt, 1967). In addition, the available evidence argues for the clinical utility of training in self-instruction for behavior change (e.g., Meichenbaum, 1971; Monohan & O'Leary, 1971).

In any case, the present results do suggest that serious consideration should be given to the possible adverse effects of extrinsic contingencies. These results lend support to the admonitions of O'Leary and Drabman (1971) and O'Leary, Paulas, and Devine (1972) that behavior modifiers should seriously face these questions and use powerful extrinsic contingency programs only after other less intrusive procedures have failed and then with discretion.

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The results of the present study are fully consistent with most other work on the generalization question in showing that unprogrammed positive generalization rarely, if ever, occurs. It seems clear from the accumulation of research data that a child should be treated in the setting where he is having difficulty. There is little reason to expect positive generalization from one setting to the other, and children who have difficulty in school and home settings should probably receive simultaneous treatment in both settings. If positive generalization across settings is desired, active programming of such generalization appears to be required.

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Footnotes

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²School observation could not be obtained on three of the eight children due to unavoidable delays in training coders. Thus, there were eight children with Walker Problem Behavior Identification Checklists at baseline and termination, but only five children with a similar set of school observations.

Table 1

Percentage of Children in Each Sample

Demonstrating "Deviance" on Each of Four Measures

	Walker	School Observation	Becker		Home Observation
			M	F	
School Problem Sample	82%	100%	67%	78%	45%
Home Problem Sample	67%	50%	100%	100%	47%

Table 2

Rank Order Correlations Between Four Measures

On All Children

	T Walker	School Deviant Behavior	Becker M F		Deviant Behavior Percent
Walker Checklist	-	-	-	-	-
School Deviant Behavior %	.01	-	-	-	-
M Becker	-.04	.20	-	-	-
F	.28	.21	-	-	-
Home Deviant Behavior %	.35*	.03	-.07	.10	-

* $p < .05$

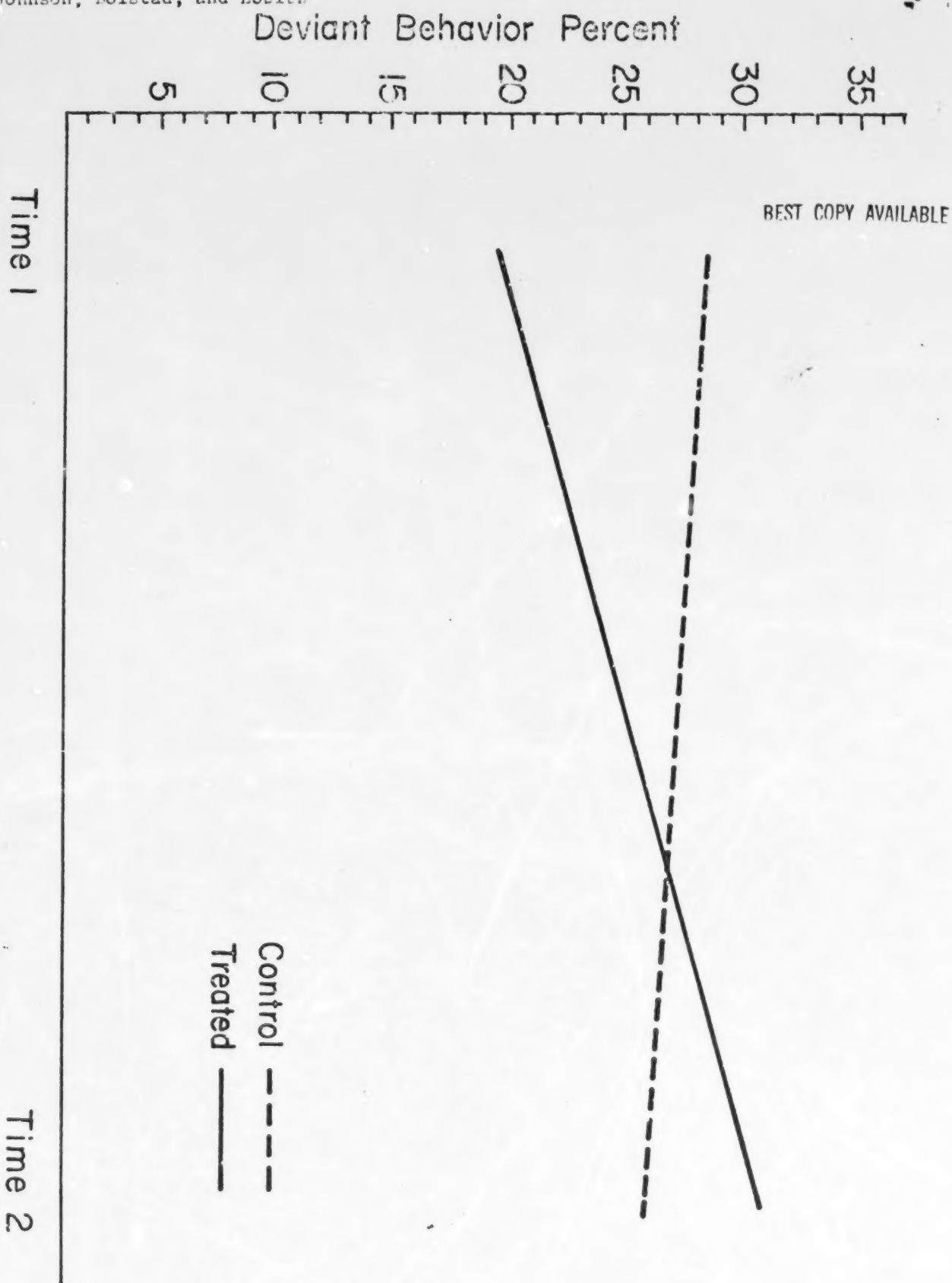


Figure 1

Observed Deviant Behavior in School for the Home Treated and
School Problem Control Samples at Two Time Points